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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
JUNTIMA, NITTAYA	

ART UNIT	PAPER NUMBER
2663	

DATE MAILED: 02/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/479,433	KHAUNTE ET AL.	
	Examiner	Art Unit	
	Nittaya Juntima	2663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on June 28, 2004.

2. The objection to drawings and the rejection under 35 U.S.C. 112, second paragraph of claim 16 are withdrawn in view of applicants' amendment.

3. Claims 1-49 remain rejected under 35 U.S.C. 103(a).

Claim Objections

4. Claim 43 is objected to because of the following informalities:

- in claim 43, an extra period should be removed.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-7, 9-24, 26-37, and 39-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Data-Over-Cable Service Interface Specifications" by Cable Television Laboratories, Inc. (DOCSIS) in view of Nose (USPN 6,643,295 B1).

Per claim 17, DOCSIS teaches a Head End (Headend, Fig. 1-2, pg. 3) of an access network (cable network, Fig. 3-3, pg. 13) comprising a plurality of nodes (Cable Modems, CMs #1-2 in Fig. 3-3, pg. 13), at least one downstream channel (a downstream channel on fiber connecting between Head End transmitter and O/E node, Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), at least one shared-access upstream channel (a shared-access upstream channel on fiber is connecting between Head End transmitter and O/E node, Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), the Headend comprising:

a source providing current time reference source (a current time reference source is inherently included in the Headend to provide time reference, section 7.1, 1st paragraph, pg. 103),

a MAP generating device (as MAP PDUs are transmitted by CMTS to the cable modems to define transmission opportunities on the upstream channel, therefore, it is inherent that a MAP generating device must be included in the CMTS to generate MAP for transmission, lines 1-2 and section 7.1.1, pg. 104),

the Headend being configured to determine a SAT (Alloc Start Time/an effective starting time t_3, section 6.3.4, pg. 75 and section 7.7.6, pg. 108) from a LAT value (a worst-case roundtrip propagation delay; $t_3 - t_1$, where t_1 is a current time value and t_3 is an effective starting time, sections 7.1.5 and 7.1.6, pgs. 107-108),

the Headend further being configured to obtain propagation delay data (propagation delay data reads on the roundtrip propagation delay, initial and periodic ranging processes performed between CMTS and a node or a portion of the plurality of nodes, e.g. a cable modem, are used to acquire the timing offset which inherently includes the roundtrip propagation delay and the processing delay, section 6.3.5, 1st paragraph, lines 1-2, pg. 78, and section 7.3.3, pgs. 110-111).

DOCSIS does not teach that the Headend dynamically adjusts the LAT value using the propagation delay data to determine an optimized LAT, wherein the Headend periodically switches between using the optimized LAT and a relaxed LAT.

However, as shown in Fig. 10, Nose teaches dynamically adjusting the current transmission delay associated with the transmission of MAP message for the at least one upstream channel using propagation delay (col. 1, ll 51-62) obtained from ranging procedures (col. 4, ll 64-col. 6, ll 1-42) to determine an optimized delay, e.g. latency L1 caused by terminal E at time T33 (Fig. 14, col. 6, ll 52-64), and a relaxed latency L2 caused by worst case estimates, i.e. the most theoretically distant terminal F at time T38 (Fig. 14, col. 6, ll 65-col. 7, ll 1-13), wherein the Headend (central control unit 1, Fig. 14) switches between using an optimized delay, e.g. latency L1, and a relaxed delay, e.g. latency L2 (col. 7, ll 9-13).

Given the teaching of Nose above and DOCSIS' suggestion on minimizing the delay, i.e. roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (ll 11-12 of section 7.1.5 on pg. 107), it would have been obvious to one skilled in the art to modify the teaching of DOCSIS by dynamically adjusting the LAT with the current maximum transmission delay of Nose to determine an optimized LAT and periodically switching between using the optimized LAT and a relaxed LAT. The motivation/suggestion to do so would have been to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems, e.g. when adding a new and most theoretically distant modem to the system, and improve the overall network efficiency (Nose, col. 1, ll 7-14 and col. 7, ll 9-13).

Claim 1 is a method claim corresponding to Headend claim 17, and therefore is rejected under the same reason set forth in the rejection of claim 17 with the addition of an access control system (CMTS, Fig. 1-2).

Per claims 2-3, 18-19, 35, 44-45, and 49, DOCSIS fails to teach a minimum propagation delay value, a maximum runtime propagation delay value, and calculating LAT using the min. propagation delay value.

However, Nose teaches a minimum propagation delay value (the transmission delay that exceeds the current one in step 14, Fig. 10, col. 6, ll 18-45, which includes a roundtrip delay, col. 1, ll 51-57) and a maximum runtime propagation delay value (the current max. transmission delay in step 15, Fig. 10, col. 6, ll 18-45). In addition, Nose teaches calculating the current transmission delay, which is based on the propagation delay of the most theoretically distant online terminal, to optimize the network efficiency (Fig. 10 and col. 6, ll 52-64).

Given the teaching of Nose and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (section 7.1.5, pg. 107, ll 11-12), it would have been obvious to one skilled in the art to include the min. and max. propagation delay values into the teaching of DOCSIS and use the min. propagation delay of Nose (the transmission delay that exceeds the current one in step 14, Fig. 10) to calculate the LAT of DOCSIS to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, ll 7-14 and col. 7, ll 9-13).

Per claims 4 and 46, DOCSIS teaches that LAT includes a MAP construction delay at the Head End (queuing delays associated with MAP implementation within the CMST), an

interleaver delay (PMD-layer FEC interleaving), the worst roundtrip delay, and a MAP processing delay at a network node (CM MAP processing time) (section 7.1.5, pg. 107).

Per claims 5-6, 22-23, 36, and 47, DOCSIS fails to teach the limitations as recited in the claims. However, as shown in Fig. 10, Nose teaches determining a first propagation delay/propagation delay value for a first node/each node that initiates a ranging procedure (steps 12 and 13), comparing the first propagation delay value to a stored propagation delay value/comparing each of the delay values to determine a largest propagation delay value (step 14), and assigning the largest propagation delay value as the minimum propagation delay value for the upstream channel (the current transmission delay is assigned in steps 14 and 15) (col. 5, ll 4-col. 6, ll 44).

Per claims 7, 24, and 37, DOCSIS teaches that the access network is a cable network (cable network in Fig. 3-3, pg. 13), the plurality of nodes are cable modems (Cable Modems, CM #1-2 in Fig. 3-3, pg. 13), the access control system is a Cable Modem Termination System (CMTS in Fig. 1-2, pg. 3 and Fig. 3-3, pg. 13), and the propagation delay data corresponds to offset data (the roundtrip propagation delay inherently included in the timing offset, ll 1-3 of pg. 110, and section 7.3.3, pgs. 110-111).

Per claims 9-10 and 26-27, DOCSIS teaches that ranging procedure is an initial ranging procedure and a periodic ranging procedure performed between the node (cable modem) and the access control system (CMST) (section 6.3.5, 1st paragraph, ll 1-2, pg. 78 and section 7.3.3, pgs. 110-111).

Per claims 11-14, 28-31, and 39-40, DOCSIS teaches that the propagation delay data associated with each on-line modem on the upstream channel must be inherently stored in a data

structure at the Head End for additional fine tuning and association with SID (section 7.3.3, pgs. 110-111), but does not teach re-calculation and an occurrence of an event as recited in claim 12.

However, Nose teaches re-calculating the min. propagation delay value (the current transmission delay time) using the stored propagation delay values, wherein the re-calculation is triggered by an occurrence of an event: a farthest on-line node switching to a different upstream channel or going off-line (operation state of the theoretically distant terminal, e.g. addition or removal of the terminal, affects and leads to recalculation of the current transmission delay, Fig. 10, col. 6, ll 13-42, 52-col. 7, ll 1-13).

Per claims 15-16, 32-33, and 41-42, DOCSIS teaches a LAT (a roundtrip propagation delay; $t_3 - t_1$) and MAP messages which do not include initial ranging slot allocations (the allocation MAP messages) (sections 7.1.5 and 7.7.6, pgs. 107-108), but fails to teach a min LAT and a second LAT as recited in the claims.

However, Nose teaches determining a min propagation delay value (the current transmission delay) corresponding to a farthest on-line node on the upstream channel (Fig. 10, col. 6, lines 52-64). Nose further teaches (i) calculating the current transmission delay, e.g. L2, using a max. propagation delay value which is based upon a maximum allowed distance between a node and the Head End in a case where a new node, e.g. node F, is located farthest from the Head End just joins, and (ii) inherently using this current transmission delay, L2, for MAP M3 transmission, which includes at least one initial ranging slot, during periodical ranging procedures (Fig. 10, col. 5, ll 11-20, col. 6, ll 35-45, and Fig. 14, col. 6, ll 52-col. 7, ll 1-13).

Given the teaching of Nose above and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to

the upstream channel (section 7.1.5, pg. 107, lines 11-12), it would have been obvious to one skilled in the art to use a min. LAT calculated by using the min. propagation delay value (the current transmission delay) to generate MAP messages and use a second LAT calculated by using a max. propagation delay value (the current transmission delay of the farthest cable modem, e.g. node F) to generate MAP messages which include at least an initial ranging slot to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, ll 7-14 and col. 7, ll 9-13).

Per claims 20-21, DOCSIS fails to teach memory for storing a min. propagation delay value and an optimized LAT value. Nose, however, teaches memory (16 in Fig. 9) for storing a min. propagation delay value (the current transmission delay) corresponding to a farthest on-line node on the upstream channel (Fig. 10, col. 6, ll 14-35).

Given the teaching of Nose and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to the upstream channel (section 7.1.5, pg. 107, ll 11-12), it would have been obvious to one skilled in the art to set the LAT of DOCSIS to the min. propagation delay (the current transmission delay) of Nose and store it as an optimized LAT derived from the min. propagation delay value (the current transmission delay) to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems and improve the overall network efficiency (Nose, col. 1, ll 7-14 and col. 7, ll 9-13).

Claim 34 is a computer program product claim corresponding to Headend claim 17, and is rejected for the same reason set forth in claim 17 with the addition that the combined teaching

of DOCSIS and Nose does not teach a computer usable medium having computer readable code which comprises computer code. However, it would have been obvious to one skilled in the art to include computer code, computer readable code, and a computer usable medium into the claimed computer program product for automatic execution, simple implementation, and portability purposes.

Claim 43 is a method for generating messages claim corresponding to Headend claim 17, and is rejected for the same reason set forth in claim 17.

Claim 48 is an apparatus for generating messages claim corresponding to Headend claim 17, and is rejected for the same reason set forth in claim 17.

7. Claims 8, 25, and 38, are rejected under 35 U.S.C. 103(a) as being unpatentable over "*Data-Over-Cable Service Interface Specifications*" by Cable Television Laboratories, Inc. (DOCSIS) in view of Nose (USPN 6,643,295 B1), and further in view of Raissinia et al. (UPSN 6,430,193 B1).

The combined teaching of DOCSIS and Nose does not teach that the access network is a wireless network.

However, as shown in Fig. 1, Raissinia et al. teaches that the access network is a wireless network (a point-to-multipoint wireless communication network 100, col. 2, ll 4-28 and col. 3, ll 64-67-col. 4, ll 1-23 and 40-54).

Given the teaching of Raissinia et al., it would have been obvious to one skilled in the art to include a wireless network such as a point-to-multipoint wireless communication network into the access network, i.e. the cable network, of the combined teaching of DOCSIS and Nose as

they both involve the same concept of accessing a shared medium in order to take advantage of low cost hardware and software which are readily available (Raissinia et al., col. 2, ll 29-35).

Response to Arguments

8. Applicant's arguments regarding claims 1, 17, 34, 43, and 48 have been fully considered but they are not persuasive.

A. In the remarks regarding independent claims 1, 17, 34, 43, and 48, applicant argues that neither DOCSIS nor Nose teach or suggest switching between the optimized LAT and the relaxed LAT (based on the worst cast propagation delay).

In response, DOCSIS does not teach that the Headend dynamically adjusts the LAT value using the propagation delay data to determine an optimized LAT, wherein the Headend periodically switches between using the optimized LAT and a relaxed LAT.

However, as shown in Fig. 10, Nose teaches dynamically adjusting the current transmission delay associated with the transmission of MAP message using propagation delay (col. 1, ll 51-62) obtained from ranging procedures (col. 4, lines 64-col. 6, lines 1-42) to determine *an optimized delay*, e.g. the current maximum latency L1 caused by terminal E at time T33 (Fig. 14, col. 6, lines 52-64), and *a relaxed latency* L2 caused by worst case estimates, i.e. the most theoretically distant terminal F later at time T38 (Fig. 14, col. 6, lines 65-col. 7, lines 1-13), wherein the Headend (central control unit 1, Fig. 14) switches between using an optimized delay, e.g. latency L1, and a relaxed delay, e.g. latency L2 (col. 7, ll 9-13).

Given the teaching of Nose above and DOCSIS' suggestion on minimizing the delay, i.e. worst-case roundtrip propagation delay/LAT in MAP message, to minimize latency of access to

the upstream channel (section 7.1.5, pg. 107, lines 11-12), it would have been obvious to one skilled in the art to modify the teaching of DOCSIS by dynamically adjusting the LAT with the current maximum transmission delay of Nose to determine an optimized LAT and periodically switching between using the optimized LAT and a relaxed LAT. The motivation/suggestion to do so would have been to enable the network to control the timing of every cable modem's data transmission according to the operation states of the cable modems, e.g. when adding a new and most theoretically distant modem to the system, and improve the overall network efficiency (Nose, col. 1, lines 7-14 and col. 7, ll 9-13). Applicant failed to point out the error in the motivation in the rejection. Therefore, the rejection is maintained.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nittaya Juntima whose telephone number is 571-272-3120. The examiner can normally be reached on Monday through Friday, 8:00 A.M - 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nittaya Juntima
January 28, 2005
NJ

RICKY NGO
PRIMARY EXAMINER